

Gouania exilis (Rhamnaceae), a new species from northern Australia and Papua New Guinea, with notes on the identity of *Gouania hillii* F.Muell.

K. R. Thiele and J. G. West

Summary

Thiele, K. R. & West, J.G. (1994). *Gouania exilis*, a new species from northern Australia and Papua New Guinea, with notes on the identity of *Gouania hillii* F.Muell. *Austrobaileya* 4 (3): 411–416. Examination of herbarium material of *Gouania* in Australia indicates that *G. hillii* F.Muell. is synonymous with *G. australiana* F.Muell. A taxon which occurs on northern Cape York Peninsula (Australia) and in Papua New Guinea, which was previously referred to *G. hillii*, is here described as *Gouania exilis* K.R.Thiele *sp. nov.*

Keywords: Rhamnaceae, *Gouania* - Australia, *Gouania hillii*, *Gouania exilis*.

K. R. Thiele & J.G. West, Australian National Herbarium, Centre for Plant Biodiversity Research, CSIRO, GPO Box 1600, Canberra, ACT, 2601, Australia

Introduction

Two species of *Gouania* Jacq., *G. australiana* F.Muell. and *G. hillii* F.Muell., are currently known from north Queensland, Australia. The name *G. hillii* has generally been applied to plants collected from the McIlwraith Range-Iron Range-Pascoe River area of Cape York, while *G. australiana* has been used for plants from further south, in the Cairns region. However, examination of types for a treatment of Rhamnaceae for the Flora of Australia has shown that this usage is incorrect.

The identity of *Gouania hillii* F.Muell.

Mueller (1874) described *Gouania hillii* from material collected near the Daintree River in north Queensland by Walter Hill. The holotype, held at MEL, comprises a branch tip with numerous mature fruits and a single leaf, and is annotated "99/Small tree/Daintree River/Gouania hillii F.v.M.". The protologue (*l.c.*) runs (our translation):

Tree, young branches and petioles dark-brown tomentose, leaves ovate- or cordate-orbicular but with slightly acute apices, quite entire, glabrous above, sparsely pilose below, racemes spiciform in a terminal panicle, fruits small, glabrous, one and a half times broader than long or less.

Near the Daintree River; Walt. Hill.

Small tree by the notes of the collector. Leaves with moderately long petioles, herbaceous rather than coriaceous, costate with nerves conspicuously raised below, 2–3" long, 1½–2" broad. Stipules caducous. Curled tips absent from the single available branch. Flowers seen only in a very withered state. Fruiting spikes semipedate or shorter. Cocci, including the wings, about 2 lines broad.

Easily separated from the other Australian species thus far collected (see *Fragm. iv.* 144) on account of its leaves with longer petioles, much more glabrous, thicker and more strongly nerved, and by the clusters on the spikes being shortly pedunculate. Fruit very similar in size and shape to *G. tomentosa*.

G. javanica (Miq. *Flor. Ind. Batav. i.* 649) differs in its leaves that are dentate along their entire length.

Mueller compared his new species with three others, viz *G. australiana* (i.e. the species he previously described from Australia in *Fragmenta* 4), *G. tomentosa* Jacq. and *G. javanica* Miq. *Gouania tomentosa* is conspecific with *G. polygama* (Jacq.) Urban, a species from central America and the West Indies (Suessenguth 1953). The noted similarity in size and shape of the fruits of these two species is probably not indicative of close relationship since many *Gouania* species have relatively similar fruit. The comparison with the south-east Asian species *G. javanica* is

somewhat misleading, since the leaf on the Hill specimen is not, in fact, quite entire as Mueller described it but has a number of minute teeth towards the leaf apex, and leaves of *G. javanica* are not always dentate along their entire length but are usually entire-margined towards the leaf base. *Gouania javanica* differs from the type of *G. hillii* in its much larger, darker fruits, sparser flower-clusters on the inflorescence axes and smaller, more distinctly toothed leaves.

The comparison with Mueller's previously described Australian species, *G. australiana*, is more important. The single leaf on the Hill specimen does indeed have a slightly longer petiole and is somewhat thicker, less densely hairy and more strongly nerved (“*folia longis petiolata multo glabrora crassiora et validius nervosa*”) than does other material of *G. australiana* that would have been available to Mueller; however, these are well within the range of variation for *G. australiana* based on the wider sample now available (Table 1). There are discernible differences in the lengths of the peduncles of the fruit-clusters between the Hill specimen and material of *G. australiana*; however, since the Hill specimen is fruiting and Mueller's type material of *G. australiana* is flowering, the comparison is not valid anyway. The specimen is identical in all other respects to *G. australiana*.

The reference on the label of the Hill specimen to the plant being a tree is puzzling, since all Australian and south-east Asian species of *Gouania* are robust lianes climbing high into the rainforest canopy by tightly curled stem-tips. Mueller himself appears to have doubted Hill on this point since, although he refers to *G. hillii* in the diagnosis as a tree, in his notes he purposely ascribes this to Hill (“*Arbor e notis inventoris minor*”) and notes the absence of curled, climbing shoot-tips from the available material (“*Cirri in ramulo unico suppetente nulli*”).

Thus, all characters by which *Gouania hillii* is supposed to differ from *G. australiana* are weak or erroneous, and the types of the two names match well. *Gouania hillii* is reduced here to a synonym of *G. australiana*:

Gouania australiana F. Muell., *Fragm.* 4: 144 (1864). **Typus:** Queensland. COOK DISTRICT: Rockingham Bay, *Dallachy* (holo: MEL).

G. hillii F. Muell., *Fragm.* 8: 163 (1874). **Typus:** Queensland. COOK DISTRICT: Daintree River, *W. Hill* (holo: MEL), *syn. nov.*

The identity of *Gouania 'hillii'* auct. non F. Muell.

While the type of *G. hillii* was collected from near the Daintree River, c.80 km north of the nearest known extant population of *G. australiana*, specimens of the taxon that has subsequently been ascribed to *G. hillii* all come from the Iron Range-McIlwraith Range-Pascoe River area, some 400 km further north (and from southern Papua New Guinea in the Port Moresby district; Fig. 2). These clearly constitute a distinct, geographically disjunct species, differing from *G. australiana* in leaf, inflorescence, fruit and seed characters (Fig 1; Table 1).

Nine species of *Gouania* occur in south-east Asia and Malesia (see Suessenguth 1953, Lauterbach 1922). Of these, two species (*G. microcarpa* DC. and *G. leptostachya* DC.) occur in Papua New Guinea; these are also the two most widely-distributed species of the genus in the region, being found in south-east Asia and eastern India.

Lauterbach (1922), in a footnote to a key to the Australasian species of *Gouania*, noted that *G. hillii* appeared to be very similar to *G. microcarpa*, but that he had before him only fragments of fruit of *G. hillii*. However, the Iron Range-McIlwraith Range plants clearly differ from *G. microcarpa*: in the former the disk margin forms attenuate processes adjacent to the sepals, and the fruit is almost as long as broad, while in *G. microcarpa* the disk has short, broad, emarginate lobes adjacent to the sepals, and the fruit pyrenes are much broader than long so that the whole fruit is propeller-shaped.

Examination of material of *G. leptostachya* DC. at BM, CANB and K, and of a microfiche photograph at AD of the type suggests that the Cape York taxon is closely

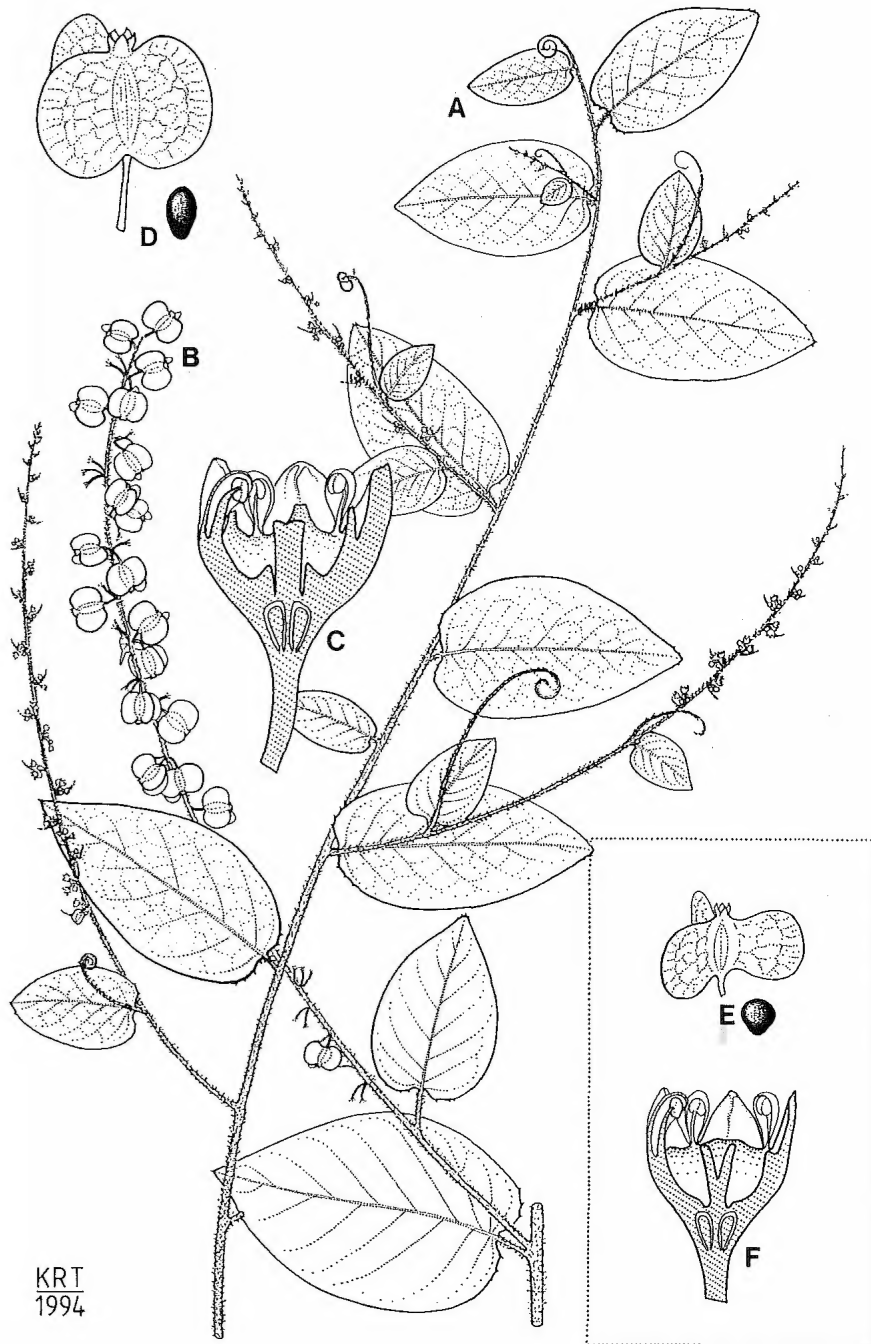


Fig. 1. A-D - *Gouania exilis*: A. habit $\times 0.5$. B. infructescence $\times 0.5$. C. half-flower $\times 10$. D. fruit and seed $\times 2.5$. E-F - *Gouania australiana*: E. fruit and seed $\times 2.5$. F. half-flower $\times 10$. A from Brass 19192 (CANB); B,D from Irvine 280 (BRI); C from Hyland 14823 (QRS); E sans coll. (BRI [AQ109541]); F from Hyland 7244 (CANB).

Table 1. Diagnostic characters of Australian *Gouania*.

| Characters\Taxa | <i>G. australiana</i> | Type of <i>G. hillii</i> | <i>G. exilis</i> |
|--------------------------------------|-------------------------------------|---------------------------------------|------------------------------------|
| leaves | thick, dark green | thick, dark green | thin, light green |
| leaf adaxial surface | scattered to dense tubercles | scattered tubercles | smooth |
| leaf abaxial lacunae | raised, verrucose | raised, verrucose | smooth |
| leaves - length (mm) - width (mm) | (52–)60–95(–120) (30–)50–80(–90) | (leaf fragmentary, not measurable) | (30–)55–70(–90) (15–)35–55(–60) |
| petiole length (mm) | 10–20 | c. 18 | (4–)6–12(–18) |
| lateral nerve widths (mm) | 2.0–3.0 | c. 2.5 | 1.0–1.5 |
| lateral nerve indumentum | sparsely to densely hirsute | densely hirsute | sparsely to densely hirsute |
| pseudoracemes | aggregated at branch-ends | aggregated at branch-ends | single, axillary |
| pedicels in fruit (mm) | 0.5–1.4 | 0.8–1.3 | 2.0–3.3 |
| pyrenes | broader than long | broader than long | about as long as broad |
| pyrene body length (mm) | 2.6–4.0 | 3.5–4.0 | 5.5–8.2 |
| inner face of pyrene | thin, membranous | thin, membranous | thick, chartaceous |
| seed length (mm) | 1.7–1.9 | c. 1.8 | 2.2–2.7 |

related to that species. They share slender inflorescence axes which tend to be single in the upper axils (rather than having stout axes aggregated towards the branch-ends, as in most other species in the region), a disk with attenuate processes and relatively large fruits that are longer than broad and have chartaceous adaxial faces to the pyrenes. However, *G. leptostachya* differs from the Cape York taxon in having leaves which are regularly finely crenate (rather than largely entire with a few small, thick teeth at the base and apex), and larger fruits and seeds.

Gouania in south-east Asia is in great need of revision, and most collections of its species in all herbaria examined are not determined to species level. Until a complete revision of *Gouania* in the region is prepared, the limits and degree of variability of its species

will be uncertain. However, the Cape York taxon is clearly distinct from all other described species. It is therefore described as a new species, *Gouania exilis* K.Thiele.

***Gouania exilis* K.Thiele, sp. nov.** *Gouaniae leptostachyae* DC. similis sed foliis plerumque integris, ad basin et apicem dentibus paucis crassis parvisque, fructibus minoribus (5.5–8.2 mm longis) et seminibus minoribus (2.2–2.7 mm longis) differt. **Typus:** Australia. Queensland. COOK DISTRICT: Iron Range, 15 June 1948, L.J. Brass 19192 (holo: CANB; iso: BRI).

Evergreen liane, climbing by curled, tendril-like shoot-tips; stems, inflorescence axes and flowers pubescent or pilose with sparse to

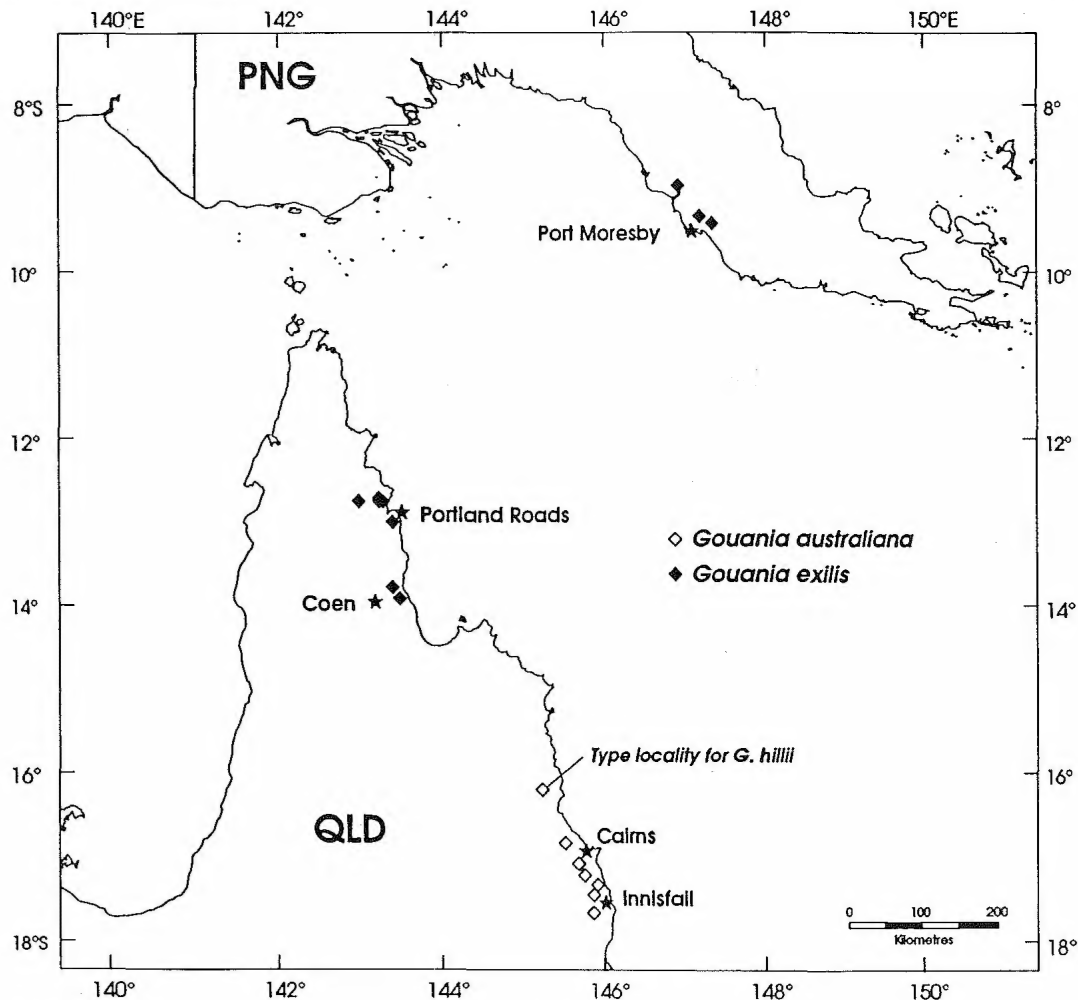


Fig. 2. Distribution of *Gouania australiana* and *G. exilis*.

dense, straight or flexuose, loosely appressed or spreading, rusty, simple hairs. Leaves alternate; lamina \pm concolorous or somewhat discolorous, ovate, (30–)55–70(–90) mm long, (15–)35–50(–60) mm wide; margin largely entire but usually with a few small, thick teeth at the base and towards the apex; base symmetric, cordate; apex acute, obtuse or acutely to obtusely acuminate; venation penninerved, the primary veins clearly visible below, diverging from the midrib at 35–60°; fully mature leaves sparsely pilose or pubescent abaxially; glabrous or sparsely pubescent or pilose adaxially; petiole (4–)6–12(–18) mm long; stipules 2–5.5 mm long, caducous, coriaceous to scarious, narrowly triangular,

acute, free, entire, abaxially sparsely pilose, adaxially glabrous. Inflorescences solitary in the upper leaf-axils, comprising 3- to many-flowered contracted cymes (appearing as congested clusters) arranged in little-branched elongate pseudoracemes; bracts caducous. Flowers bisexual, 5-partite; pedicels 0.9–2 mm long; hypanthium cup-shaped, 1.4–2.5 mm diameter; sepals 0.75–1.4 mm long, erect to incurved, persistent on fruits; petals 0.75–1 mm long, cucullate, not clawed; stamens subequal to petals, incurved; anther 0.4–0.5 mm long; disk conspicuous, lining the hypanthium tube, smooth, glabrous, the margin with short, linear lobes adjacent to the sepals; ovary inferior, 3-carpellate. Fruit a pale brown

ellipsoid or globular schizocarp, 5.5–8.2 mm long with lateral wings 2–3.5 mm wide, crowned by the persistent sepals. Seed 2.2–2.7 mm long, uniformly dark brown. **Fig. 1, A–D.**

Additional specimens examined: Papua New Guinea: Kanosia, Apr 1935, *Carr* 11754 (CANB [CANB61663]); Rouna, Jun 1935, *Carr* 12481 (CANB [CANB44425]); Tovobada Hills, 12 miles N of Port Moresby, May 1965, *Heyligers* 1192 (CANB [CANB155487]); Tavai Creek area, c. 46 miles SE of Port Moresby, May 1967, *Pullen* 6888 (CANB [CANB169121]); Brown River Forest Reserve, Jun 1960, *Gray & Thorne* [NGF12893] (CANB [CANB98804]). Australia, Queensland. COOK DISTRICT: Pascoe River - Talus Ridge, Jul 1972, *Irvine* 280 (BRI [AQ109542]); West Claudie River, Jun 1972, *Hyland* 6187 (CANB [CANB242543]); Claudie River between Portland Roads and Iron Range, Oct 1968, *Webb & Tracey* 8532 (BRI [AQ3076]); Claudie River, Jun 1993, *Hyland* 14823 (QRS [QRS101980]); Rocky River on the eastern foothills of McIlwraith Range, Oct 1969, *Webb & Tracey* 9519 (BRI [AQ109544]).

Distribution and habitat: occurs in Papua New Guinea north of Port Moresby and in north Queensland, Australia, between the Pascoe River (Iron Range) and Rocky River (McIlwraith Range) (**Fig. 2**), in rainforests and vine forests on the lower slopes of the ranges, at 20–150 m altitude. Flowers in April–June; fruits in June–October.

Conservation status: This species, as *G. hillii*, has been assigned a conservation status of 3R by Briggs and Leigh (1989) and Thomas and MacDonald (1989). This should be amended to 3R+ since it is now known to occur outside Australia.

Derivation of name: from Latin *exilis* (thin, slender, meagre), in reference to the sparse, slender inflorescences.

Acknowledgements

We thank Ian Brooker, Tony Orchard and Douglas Kelly for help with the Latin translations and the directors of BRI, MEL and QRS for the loan of material; Bernie Hyland (QRS) first pointed out to us that typification of *G. hillii* was problematical. This work was undertaken with support from the Australian Biological Resources Study (ABRS).

References

- BRIGGS, J.D. & LEIGH, J.H. (1989). *Rare or Threatened Australian Plants*. Revised edition. Canberra: Australian National Parks and Wildlife Service.
- LAUTERBACH, C. (1922). Rhamnaceen Papuasiens. *Bot. Jahrb. Syst.* 57: 335–340.
- MUELLER, F. (1874). *Fragmenta Phytographiae Australiae* 8: 163–4. Melbourne: Government Printer.
- SUESSENGUTH, K. (1953). Rhamnaceae, in A. Engler & K. Prantl, *Nat. Pflanzenfam.* 20d: 7–173. Berlin: Duncker & Humblot.
- THOMAS, M.B. & McDONALD, W.J.F. (1989). *Rare and Threatened Plants of Queensland*. 2nd edition. Brisbane: Queensland Department of Primary Industries.